



1769-L32C, -L35CR CompactLogix Controllers

Catalog Number 1769-L32C, 1769-L35CR

To:	See page:
Make Sure that You Have All the Components	6
Plan the System	7
Set the Node Address	8
Connect the 1769-BA Battery	9
Install a 1784-CF64 Industrial CompactFlash Card (optional)	11
Assemble the System	12
Mount the System	15
Connect a Programming Terminal to the Controller Via RS-232 Connections	18
Make ControlNet Connections to the Controller	21
Install the Appropriate Electronic Data Sheet (EDS) Files	25
Load the Controller Firmware	25
Select the Controller's Operating Mode	28
Verify Proper Controller Operation	29
See the Specifications	34
Obtain Related Documentation	36

Before You Begin

Use this document as a guide for installing and powering-up your 1769-L32C or 1769-L35CR CompactLogix controller. You should already be familiar with the system components.

You must FLASH upgrade the firmware on your CompactLogix controller before you can use it. The controller ships with firmware revision 1.x but must be upgraded to match the version of RSLogix 5000 that you are using (e.g., if you are using RSLogix 5000 V13, you must upgrade your CompactLogix controller firmware to revision 13.x before using it). For more information on upgrading your controller's firmware, see page 25.

Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. *Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls* (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at <http://www.ab.com/manuals/gi>) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

Reproduction of the contents of this manual, in whole or in part, without written permission of Rockwell Automation, Inc. is prohibited.

Throughout this manual, when necessary we use notes to make you aware of safety considerations.

WARNING 	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.
ATTENTION 	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you: • identify a hazard • avoid a hazard • recognize the consequence
SHOCK HAZARD 	Labels may be located on or inside the equipment (e.g., drive or motor) to alert people that dangerous voltage may be present.
BURN HAZARD 	Labels may be located on or inside the equipment (e.g., drive or motor) to alert people that surfaces may be dangerous temperatures.

Environment and Enclosure Information

ATTENTION

This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 meters without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as "open type" equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

NOTE: See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure. Also, see the appropriate sections in this publication, as well as the Allen-Bradley publication 1770-4.1 ("Industrial Automation Wiring and Grounding Guidelines"), for additional installation requirements pertaining to this equipment.

North American Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations:	Informations sur l'utilisation de cet équipement en environnements dangereux:
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.	Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.
WARNING 	EXPLOSION HAZARD • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of components may impair suitability for Class I, Division 2. • If this product contains batteries, they must only be changed in an area known to be nonhazardous.
AVERTISSEMENT 	RISQUE D'EXPLOSION • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. • La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles.

Prevent Electrostatic Discharge

ATTENTION

This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
 - Wear an approved grounding wriststrap.
 - Do not touch connectors or pins on component boards.
 - Do not touch circuit components inside the equipment.
 - If available, use a static-safe workstation.
 - When not in use, store the equipment in appropriate static-safe packaging.
-

Remove and Insert Under Power

WARNING

When you insert or remove the CompactFlash Card while power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance that can affect module operation.

Make Sure that You Have All the Components

These components ship with the controller:

Table 1

Component:	Description:	
	1769-BA battery	
	IMPORTANT	The 1769-BA battery is the only battery you can use with the CompactLogix controller.
	1747-KY controller key	

You may also use these components with the controller:

Table 2

If you want to:	Then use this component:	For more information, see page:
add nonvolatile memory	1784-CF64 Industrial CompactFlash card	11
connect a device to the RS-232 port	1756-CP3 or 1747-CP3 serial cable	18
connect to the ControlNet network	Either: • ControlNet taps for connections from controller channels A or B to the ControlNet network or • 1786-CP cable for connections from a programming terminal to the ControlNet network via the controller's Network Access Port (NAP)	22 23

Plan the System

Consider the following when planning your CompactLogix system:

- The CompactLogix controller is always the left-most module in the system.
- The CompactLogix controller must be located within four modules of the power supply.
- Some I/O module's may be located up to 8 modules away from the power supply. See the documentation for your 1769 I/O modules for details.
- The 1769-L32C controller supports as many as 16 I/O modules in a maximum of 3 I/O banks with 2 expansion cables.
- The 1769-L35CR controller supports as many as 30 I/O modules in a maximum of 3 I/O banks with 2 expansion cables.
- Each I/O bank requires its own power supply.
- Only one controller can be used in a CompactLogix system.
- A 1769-ECR (right end cap) or 1769-ECL (left end cap) is required to terminate the end of the communication bus.

ATTENTION



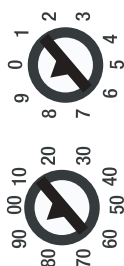
This controller has a Network Access Port (NAP) for temporary connections to the ControlNet network. Do not plug a DH-485 network cable or an RJ-45 connector for EtherNet/IP into the NAP. Undesirable behavior and/or damage to the port may result.

Set the Node Address

Every ControlNet network requires at least one module that is able to store parameters and configure the network with those parameters upon start-up. The CompactLogix controller is called a 'keeper' because it keeps the network configuration. The CompactLogix controller can keep the network parameters at any legal node address (01 to 99). Multiple devices on any one network can act as the network keepers. Each device capable of being the network keeper acts to back up the current keeper. This backup function is automatic and requires no action on your part.

Node address switches are set to the 99 position at shipment, as shown in Figure 1.

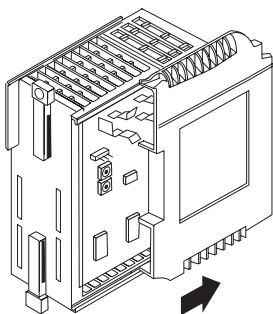
Figure 1



43868

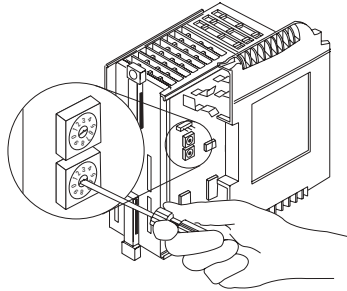
1. Slide the side cover forward, as shown in Figure 2.

Figure 2



43860

2. Set the node address via the controller switches and a small screwdriver, as shown in Figure 3.

Figure 3

31504-M

After setting the node address switches, write the node address on the front panel overlay.

Connect the 1769-BA Battery

The controller is shipped with the 1769-BA battery packed separately. To connect the battery, follow the procedure shown below.

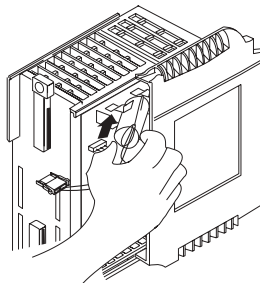
ATTENTION

The 1769-BA battery is the only battery you can use with the CompactLogix controllers. The 1747-BA battery is not compatible with the CompactLogix controllers and may cause problems.

IMPORTANT

Do not remove the plastic insulation covering the battery. The insulation is necessary to protect the battery contacts.

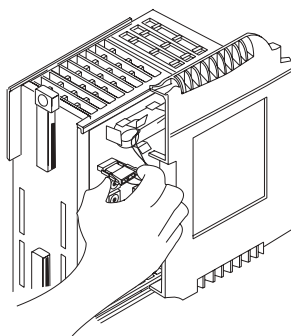
1. Insert the battery into the battery port.

Figure 4

31499-M

2. Insert the battery connector into the connector port. The connector is keyed to engage with the correct polarity.

Figure 5



31500-M

3. Slide the side cover back until it clicks into position.

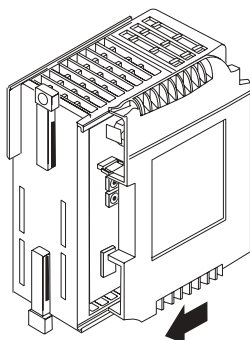
WARNING



When you connect or disconnect the battery an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

For Safety information on the handling of lithium batteries, including handling and disposal of leaking batteries, see *Guidelines for Handling Lithium Batteries*, publication AG 5-4.

Figure 6



31501-M

Install a 1784-CF64 Industrial CompactFlash Card (optional)

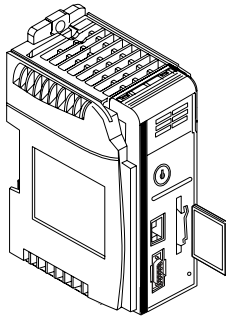
ATTENTION

Do not remove the CompactFlash card while the controller is reading from or writing to the card, as indicated by a flashing green CF LED. This could corrupt the data on the card or in the controller, as well as corrupt the latest firmware in the controller.

A 1784-CF64 Industrial CompactFlash card provides nonvolatile memory for a CompactLogix controller. This is an optional feature and is not required to operate the controller. Install the card as follows:

1. Push the locking tab to the right.
2. Insert the 1784-CF64 Industrial CompactFlash card into the socket on the front of the controller. The label of the CompactFlash card faces towards the left. Match the orientation arrow on the card with the arrow on the front of the controller.

Figure 7



The CompactFlash card supports removal and insertion under power.

WARNING

When you insert or remove the CompactFlash Card while power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance that can affect module operation.

To remove the CompactFlash card, push the locking tab away from the CompactFlash card and pull the CompactFlash card from the socket.

Assemble the System

The controller can be attached to an adjacent I/O module or power supply *before* or *after* mounting. For mounting instructions, see Panel mounting on page 17 or DIN rail mounting on page 17.

WARNING

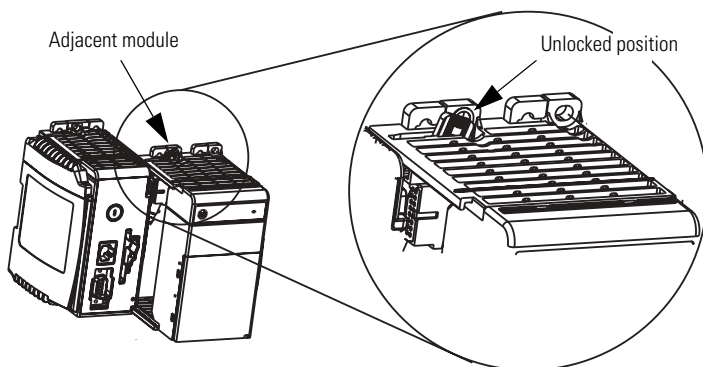


The CompactLogix controller is not designed for removal and insertion under power. If you connect or disconnect the communications cable while power is applied to this module or the wiring while the field-side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

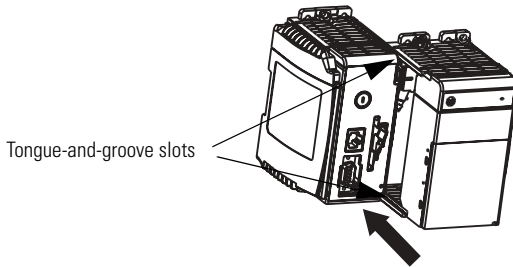
1. Disconnect line power.
2. Make sure the lever of the adjacent module is in the unlocked (fully right) position.

Figure 8

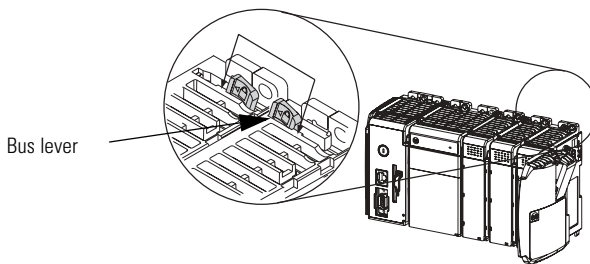


3. Use the upper and lower tongue-and-groove slots to secure the modules together.

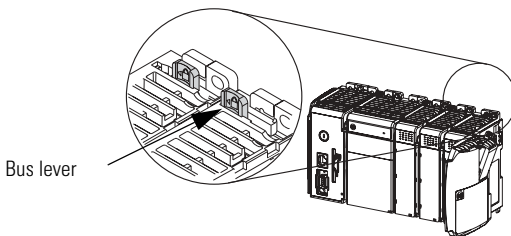
4. Move the module back along the tongue-and-groove slots until the bus connectors line up with each other.

Figure 9

5. Use your fingers or a small screwdriver to push the module's bus lever back slightly to clear the positioning tab.

Figure 10

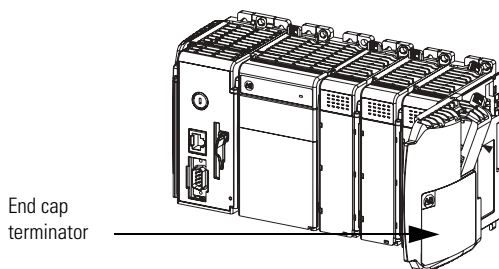
6. Move the module's bus lever fully to the left until it clicks. Make sure the Bus Lever is fully engaged and locked.

Figure 11**ATTENTION**

When attaching the controller, power supply and I/O modules, make sure the bus connectors are securely locked together to ensure proper electrical connection.

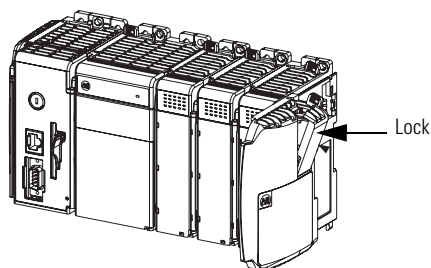
7. Use the tongue-and-groove slots (described in steps 2 and 3), to attach an end cap terminator to the last module in the system.

Figure 12



8. Move the end cap terminator back along the tongue-and-groove slots until the bus connectors line up with each other.
9. Lock the end cap bus terminator.

Figure 13



Mount the System

ATTENTION



During panel or DIN rail mounting of all devices, be sure that all debris (metal chips, wire strands, etc.) is kept from falling into the controller. Debris that falls into the controller could cause damage while the controller is energized.

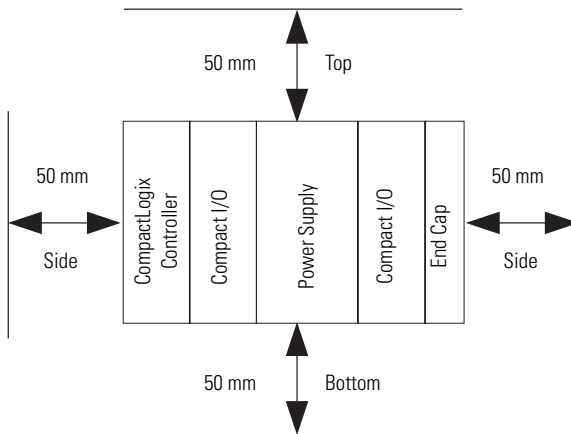
IMPORTANT

When mounting the CompactLogix system, either use screws to panel mount system OR use DIN rail. Do NOT use both. Use of both mounting methods may cause hardware damage and cause the system to fail.

Minimum spacing

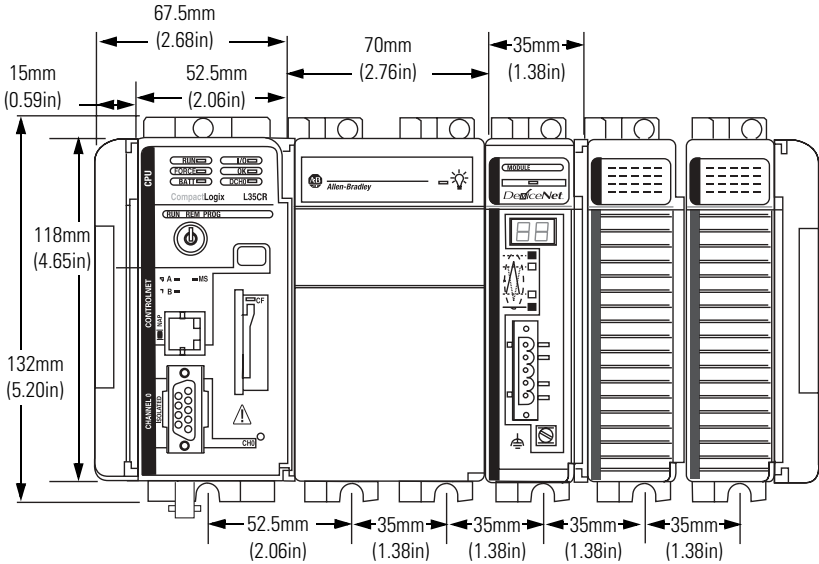
Maintain spacing from enclosure walls, wireways, adjacent equipment, etc. Allow 50 mm (2 in.) of space on all sides, as shown. This provides ventilation and electrical isolation.

Figure 14



System dimensions

Figure 15



NOTE: All dimensions are in mm (in.).
Hole spacing tolerance: ± 0.4 mm (0.016 in.)

31502-M

TIP

Compact I/O expansion cables have the same dimensions as the end caps. Expansion cables can be used on either the right or left end. A 1769-ECR (right end cap) or 1769-ECL (left end cap) terminates the end of the communication bus.

Panel mounting

Mount the controller to a panel using two screws per module. Use M4 or #8 panhead screws. Mounting screws are required on every module.

The following procedure allows you to use the assembled modules as a template for drilling holes in the panel. Due to module mounting hole tolerance, it is important to follow these procedures:

1. On a clean work surface, assemble no more than three modules.
 2. Using the assembled modules as a template, carefully mark the center of all module-mounting holes on the panel.
 3. Return the assembled modules to the clean work surface, including any previously mounted modules.
 4. Drill and tap the mounting holes for the recommended M4 or #8 screw.
 5. Place the modules back on the panel and check for proper hole alignment.
 6. Attach the modules to the panel using the mounting screws.
- TIP**
- If mounting more modules, mount only the last one of this group and put the others aside. This reduces remounting time during drilling and tapping of the next group.
7. Repeat steps 1 to 6 for any remaining modules.

DIN rail mounting

The controller can be mounted using the following DIN rails:

- 35 x 7.5 mm (EN 50 022 - 35 x 7.5)
- 35 x 15 mm (EN 50 022 - 35 x 15)

Before mounting the controller on a DIN rail, close the DIN rail latches. Press the DIN rail mounting area of the controller against the DIN rail. The latches will momentarily open and lock into place.

Grounding considerations

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel. Additional grounding connections from the controller's mounting tabs or DIN rail (if used), are not required unless the mounting surface cannot be grounded. Refer to *Industrial Automation Wiring and Grounding Guidelines*, Allen-Bradley publication 1770-4.1, for additional information.

ATTENTION



This Product is grounded through the DIN rail to chassis ground. Use zinc plated yellow-chromate steel DIN rail to assure proper grounding. The use of other DIN rail materials (e.g. aluminum, plastic, etc.) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding.

Connect a Programming Terminal to the Controller Via RS-232 Connections

Use an RS-232 cable to connect your CompactLogix controller to your programming terminal. You can use either of the following RS-232 cables:

- 1747-CP3

or

- 1756-CP3

WARNING

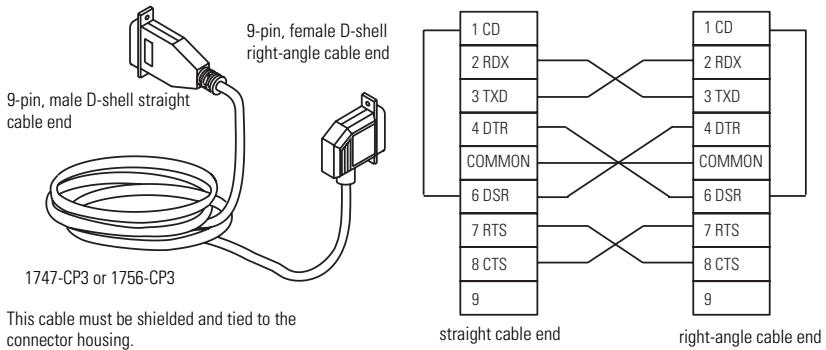


If you connect or disconnect the serial cable with power applied to this module or the serial device on the other end of the cable, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

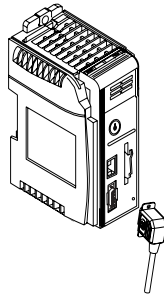
Figure 16 shows the RS-232 cable connections.

Figure 16



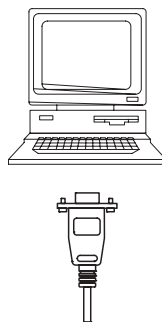
1. Connect the 9-pin, right-angle connector of the RS-232 cable to the serial port on your CompactLogix controller.

Figure 17



2. Connect the 9-pin, straight connector of the RS-232 cable to your programming terminal.

Figure 18



Default serial configuration

Channel 0 (serial) has the following default communication configuration.

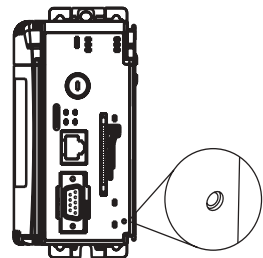
Table 3

Parameter	Default
Protocol	DF1 full-duplex
Baud Rate	19.2 Kbit/s
Parity	none
Station Address	0
Control Lines	no handshaking
Error Detection	BCC
Embedded Responses	auto detect
Duplicate Packet (Message) Detect	enabled
ACK Timeout	50 (x 20 ms)
NAK Receive Limit	3 retries
ENQ Transmit Limit	3 retries
Data Bits	8
Stop Bits	1

Using the channel 0 default communication push button

The Channel 0 Default Communication Push Button is located on the front of the controller in the lower right corner as shown in the illustration below.

Use the Channel 0 Default Communication Push Button to change from the user-defined communication configuration to the default communications mode. The Channel 0 Default Communications (DCH0) LED turns on (green, steady) to show when the default communication configuration is active.



TIP

Before pressing the Default Communication Push Button, be sure to note the present communication configuration for Channel 0. Pushing the Default Communication Push Button resets all configured parameters back to their default settings. To return the channel to its user-configured parameters, you must enter them manually while online with the controller or download them as part of an RSLogix 5000 Project file. To accomplish this online using RSLogix 5000, enter the Controller Properties screen and use the Serial Port, System Protocol and User Protocol tabs.

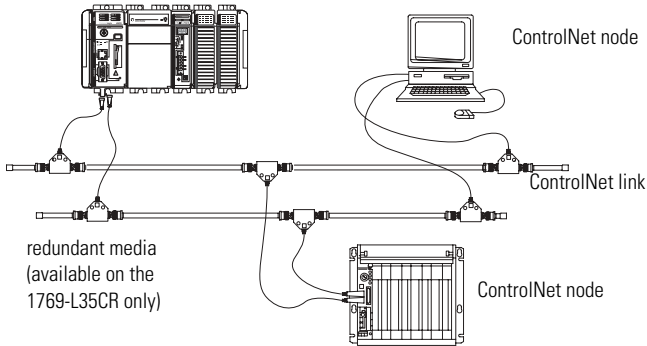
Make ControlNet Connections to the Controller

The CompactLogix 1769-L32C and 1769-L35CR controllers connect to the ControlNet network.

- The CompactLogix 1769-L32C controller supports channel A connections only.
- The CompactLogix 1769-L35CR controller supports channels A and B (redundant media) connections.

For permanent connections to the network, you connect the module to the ControlNet network using a ControlNet tap (e.g., 1786-TPR, -TPS, -TPYR, -TPYS). Figure 19 shows an example ControlNet network using redundant media.

Figure 19



43893

When connecting the CompactLogix controller to a ControlNet network, you should also refer to the following documentation:

- ControlNet Coax Tap Installation Instructions, publication 1786-IN007
- ControlNet Cable System Planning and Installation Manual, publication 1786-6.2.1

TIP

For network connections we recommend taps with a straight connector (1786-TPS or 1786-TPYS) because of the location of the BNC connectors on the bottom of the module.

Connect the Controller to the Network Via a ControlNet Tap

Typically, ControlNet taps are used to make permanent connections from the CompactLogix controller to the network. Perform the following steps to connect the module to the network using a ControlNet tap.

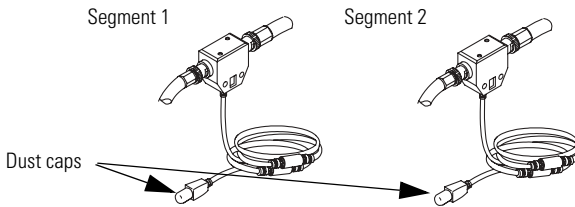
1. Remove and save the dust cap(s) from the ControlNet tap(s).

ATTENTION



Do not allow any metal portions of the tap to contact any conductive material. If you disconnect the tap from the module, place the dust cap back on the straight or right angle connector to prevent the connector from accidentally contacting a metallic grounded surface.

Figure 20



2. Connect the tap's straight or right-angle connector to the module's BNC connector as shown in Figure 21 on page 23.

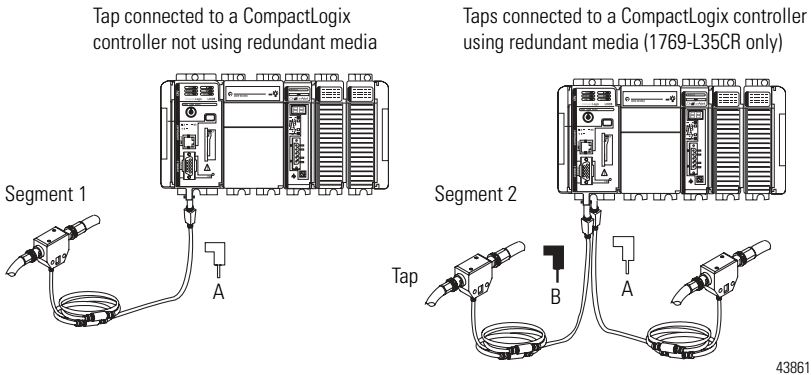
WARNING



If you connect or disconnect the communications cable with power applied to this module or any device on the network, an electrical arc can occur. This could cause an explosion in hazardous location installations.

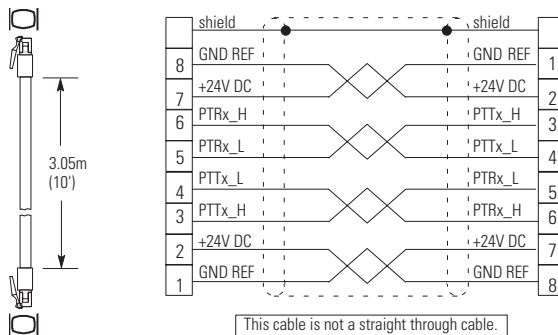
IMPORTANT

To prevent inadvertent reversal of the tap connections (resulting in incorrect status displays requiring troubleshooting), check the tap drop cable for the label indicating the attached segment before making your connection.

Figure 21

Connect a Programming Terminal to the Network Via a 1786-CP Cable

You can use the CompactLogix controller's network access port (NAP) to connect a programming terminal to the ControlNet network. Figure 22 shows the 1786-CP cable connections.

Figure 22

ATTENTION

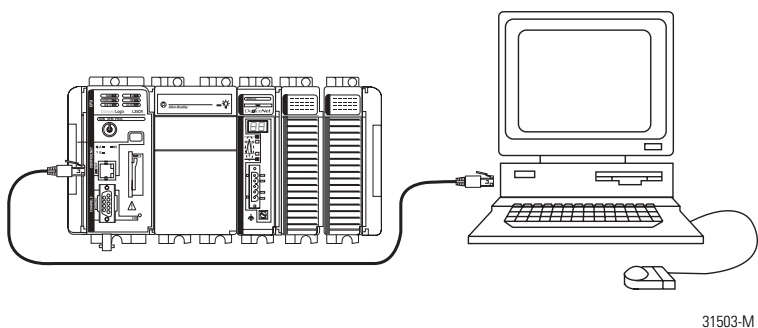


Use the 1786-CP cable when you connect a programming terminal to the network through the NAP; using another cable could result in possible network failures or product damage.

The NAP is for temporary local programming purposes only and not intended for permanent connection.

Connect one end of the 1786-CP cable to the CompactLogix controller and the other end to NAP of the programming terminal.

Figure 23



ATTENTION



Do not plug a DH-485 network cable or an RJ-45 connector for EtherNet/IP to the NAP. Undesirable behavior and/or damage to the port may result.

Install the Appropriate Electronic Data Sheet (EDS) Files

If you have RSLinx software, version 2.43 or greater, the most current EDS files were installed with the software. If you are using RSLinx software, version 2.42 or earlier, you might need to install EDS files. You need EDS files for:

- 1769-L32C controller
- 1769-L32C ControlNet port
- 1769-L35CR controller
- 1769-L35CR ControlNet port
- 1769 CompactBus
- 1769 local adapter

All of these EDS files, except for the 1769 CompactBus file, are updated for each firmware revision. There is also a revision 1.x of the EDS files that you need for new controllers. Each controller ships with revision 1.x firmware. In order to update the firmware, you must have these revision 1.x EDS files installed:

- 0001000E00500100.eds for the controller
- 0001000C00A00100.eds for the ControlNet port

The EDS files are available on the CD for RSLogix 5000 Enterprise Series software, version 13. The files are also available at:

<http://www.ab.com/networks/eds>.

Load the Controller Firmware

The controller ships without working firmware. You must download the current firmware before you can use the controller. To load firmware, you can use:

- ControlFlash utility that ships with RSLogix 5000
- AutoFlash that starts through RSLogix 5000 when you try to download a project and the controller does not have the current firmware.
- 1784-CF64 CompactFlash card with valid memory already loaded

The firmware is available with RSLogix 5000 or you can download it from the support website:

1. Go to <http://support.rockwellautomation.com>
2. In the left column (frame), select Firmware Updates under Technical Support
3. Select the firmware revision.

The download process will require you to enter the serial number of your RSLogix 5000 programming software.

If you load (flash) controller firmware via the ControlFlash or AutoFlash utilities, you need either a serial or ControlNet connection to the controller. Flashing via a ControlNet connection is faster than the serial connection.

Using ControlFlash to load firmware

You can use ControlFlash to load firmware through either a ControlNet connection or a serial connection.

1. Make sure the appropriate network connection is made before starting.
2. Start the ControlFlash utility. Click Next when the Welcome screen appears.
3. Select the catalog number of the controller and click Next.
4. Expand the network until you see the controller. If the required network is not shown, first configure a driver for the network in RSLinx software.
5. Select the controller and click OK
6. Select the revision level to which you want to update the controller and click Next.
7. To start the update of the controller, click Finish and then click Yes.
8. After the controller is updated, the status box displays *Update complete*. Click OK.
9. To close ControlFlash software, click Cancel and then click Yes.

Using AutoFlash to load firmware

You can use AutoFlash to load firmware through either a ControlNet connection or a serial connection.

1. Make sure the appropriate network connection is made before starting.
2. Use RSLogix 5000 programming software to attempt to download to a controller project. This automatically launches AutoFlash.
3. Select the catalog number of the controller and click Next.
4. Expand the network until you see the controller. If the required network is not shown, first configure a driver for the network in RSLinx software.
5. Select the controller and click OK
6. Select the revision level to which you want to update the controller and click Next.
7. To start the update of the controller, click Finish and then click Yes.
8. After the controller is updated, the status box displays *Update complete*. Click OK.
9. To close AutoFlash software, click Cancel and then click Yes.

Using a CompactFlash card to load firmware

If you have an existing controller that is already configured and has firmware loaded, you can store the current controller user program and firmware on CompactFlash and use that card to update other controllers.

1. Use RSLogix 5000 software to store the controller user program and firmware of a currently configured controller to the CompactFlash card.

Access the Nonvolatile Memory tab of the Controller Properties dialog. Make sure to select Load Image On Powerup when you save to the card.

2. Remove the card and insert it into a controller that you want to have the same firmware and controller user program.
3. When you power up the second controller, the image stored on the CompactFlash card is loaded into the controller.

Select the Controller's Operating Mode

Use the keyswitch on the front panel of the controller to determine the controller's operating mode.

Table 4

Keyswitch Position		Description
RUN		• Upload projects. • Run the program and enable outputs. • You cannot create or delete tasks, programs, or routines. You cannot create or delete tags or edit online while the keyswitch is in the RUN position. • You cannot change the mode using the programming software while the keyswitch is in the RUN position.
PROG		• Disable outputs. • Upload/download projects. • Create, modify, and delete tasks, programs, or routines. • The controller does not execute (scan) tasks while the keyswitch is in the PROG position. • You cannot change the mode through the programming software while the keyswitch is in the PROG position.
REM		• Upload/download projects. • Change between Remote Program, Remote Test, and Remote Run modes through the programming software.
	Remote Run	• The controller executes (scans) tasks. • Enable outputs. • Edit online.
	Remote Program	• Disable outputs. • Create, modify, and delete tasks, programs or routines. • Download projects. • Edit online. • The controller does not execute (scan) tasks.
	Remote Test	• Execute tasks with outputs disabled. • Edit online.

Verify Proper Controller Operation

To verify that your controller is operating properly, use the controller's various status indicators as described in the following pages.

Controller LEDs

Table 5

If this indicator:	has this display:	It means:
RUN	off	The controller is in Program or Test mode.
	steady green	The controller is in Run mode.
FORCE	off	No tags contain I/O force values. I/O forces are inactive (disabled).
	steady amber	I/O forces are active (enabled). I/O force values may or may not exist.
	flashing amber	One or more input or output addresses have been forced to an On or Off state, but the forces have not been enabled.
BAT	off	The battery supports memory.
	steady red	Either the battery is: - not installed. In this case, install the battery. 95% discharged and should be replaced.
I/O	off	Either of the following: - There are <i>no</i> devices in the I/O configuration of the controller. - The controller does <i>not</i> contain a project (controller memory is empty).
	steady green	The controller is communicating with all the devices in its I/O configuration.
	flashing green	One or more devices in the controller's I/O configuration are <i>not</i> responding.
	flashing red	The controller is not communicating to any devices. The controller is faulted.

Table 5

If this indicator:	has this display:	It means:						
OK	off	No power is applied.						
	flashing red	<table><tr><td>If the controller is:</td><td>Then:</td></tr><tr><td>a new controller</td><td>the controller requires a firmware update</td></tr><tr><td>not a new controller</td><td>A major fault occurred. To clear the fault, either: - Turn the keyswitch from PROG to RUN to PROG - Go online with RSLogix 5000</td></tr></table>	If the controller is:	Then:	a new controller	the controller requires a firmware update	not a new controller	A major fault occurred. To clear the fault, either: - Turn the keyswitch from PROG to RUN to PROG - Go online with RSLogix 5000
	If the controller is:	Then:						
	a new controller	the controller requires a firmware update						
	not a new controller	A major fault occurred. To clear the fault, either: - Turn the keyswitch from PROG to RUN to PROG - Go online with RSLogix 5000						
steady red	Controller detected a non-recoverable fault and cleared the project. To recover: 1. Cycle power to the chassis. 2. Download the project. 3. Change to Run mode. If the OK LED remains solid red, contact your Rockwell Automation representative or local distributor.							
steady green	Controller is OK.							
flashing green	The controller is storing or loading a project to or from nonvolatile memory.							

RS-232 serial port LEDs (channel 0)

Table 6

Indicator:	Color:	Description:
DCH0	off	Channel 0 is configured differently than the default serial configuration.
	steady green	Channel 0 has the default serial configuration.
CH0	off	No RS-232 activity.
	flashing green	RS-232 activity.

CompactFlash card LED

ATTENTION



Do not remove the CompactFlash card while the controller is reading from or writing to the card, as indicated by a flashing green CF LED. This could corrupt the data on the card or in the controller, as well as corrupt the latest firmware in the controller.

Table 7

Indicator:	Color:	Description:
CF	off	No activity.
	flashing green	The controller is reading from or writing to the CompactFlash card.
	flashing red	CompactFlash card does not have a valid file system.

Interpret Status Indicators as Related to the ControlNet Network

Use the following status indicators to determine how your CompactLogix controller is operating on the ControlNet network:

- Module Status
- Network Status

These status indicators provide information about the controller and the network when the controller is connected to ControlNet via the BNC connectors. describes the possible conditions for module and network status indicators.

Table 8

If an indicator is described in this condition:	It means:
steady	The indicator is on continuously in the defined state.
alternating	Two indicators alternate between the two defined states at the same time (applies to both indicators when <i>viewed together</i>); the two indicators are always in opposite states, out of phase.
flashing	The indicator alternates between the two defined states (applies to each indicator viewed independent of the other); if both indicators are flashing, they flash together, in phase.

IMPORTANT

Keep in mind that the Module Status indicator reflects the module state (e.g., self-test, firmware update, normal operation but no connection established). The network status indicators, A and B, reflect network status. Remember that the host is able to engage in local messaging with the card although it is detached from the network. Therefore, the Module Status LED is flashing green if the host has successfully started the card. Note, however, that until the host removes reset, all LEDs on the daughtercard will remain off.

When you view the indicators, always view the Module Status indicator first to determine the state of the daughtercard. This information may help you to interpret the network status indicators. As a general practice, view all status indicators (Module Status and Network Status) together to gain a full understanding of the daughtercard's status.

Module Status (MS) indicator

Table 9

If the Module Status (MS) indicator is:	It means:	Take this action:
off	the controller has no power.	Apply power.
	the controller is faulted.	Make sure that the controller is firmly seated in the slot.
steady red	a major fault has occurred on the controller.	1. Cycle power. 2. If the problem persists, replace the controller.
flashing red	a minor fault has occurred because a firmware update is in progress.	No action required (firmware update in progress.)
	a node address switch change occurred. The controller's node address switches may have been changed since power-up.	Change the node address switches back to the original setting. The module will continue to operate properly.
	the controller uses invalid firmware.	Update the controller firmware with the ControlFlash Update utility.
	the controller's node address duplicates that of another device.	1. Remove power. 2. Change the node address to a unique setting. 3. Reapply power.
steady green	connections are established.	None
flashing green	no connections are established.	Establish connections, if necessary.
flashing red/green	the controller is performing self-diagnostics.	Wait briefly to see if problem corrects itself. If problem persists, check the host. If the daughtercard cannot communicate with the host, the card may remain in self-test mode.

Network Channel Status indicators



Channel B is only labelled on the 1769-L35CR controller. The 1769-L32C controller only has channel A but uses the second indicator in some LED patterns as described in Table 10.

Table 10

If both channel indicators are:	It means:	Take this action:
off	a channel is disabled.	Program network for redundant media, if necessary.
steady green	normal operation is occurring.	None
flashing green/off	temporary network errors have occurred.	1. Check media for broken cables, loose connectors, missing terminators, etc. 2. If condition persists, refer to the ControlNet Planning and Installation Manual, publication 1786-6.2.1.
	the node is not configured to go online.	Make sure the network keeper is present and working and the selected address is less or equal to the UMAX ⁽¹⁾ .
flashing red/off	media fault has occurred.	1. Check media for broken cables, loose connectors, missing terminators, etc. 2. If condition persists, refer to the ControlNet Planning and Installation Manual, publication 1786-6.2.1.
	no other nodes present on the network.	Add other nodes to the network.
flashing red/green	the network is configured incorrectly.	Reconfigure the ControlNet network so that $UMAX \geq$ the card's node address.
If either channel indicator is:	It means:	Take this action:
off	you should check the MS indicators.	Check the MS indicators.
steady red	the controller is faulted.	1. Cycle power. 2. If the fault persists, contact your Rockwell Automation representative or distributor.
alternating red/green	the controller is performing a self-test.	None
alternating red/off	the node is configured incorrectly.	Check the card's network address and other ControlNet configuration parameters.

⁽¹⁾ UMAX is the highest node address on a ControlNet network that can transmit data.

Specifications

Description	1769-L32C	1769-L35CR
Communication Ports	RS-232, NAP, ControlNet channel A	RS-232, NAP, ControlNet channels A and B
User Memory	750 Kbytes	1.5 Mbytes
Nonvolatile Memory	1784-CF64 CompactFlash	
Maximum Number of I/O Modules	16 I/O modules	30 I/O modules
Maximum Number of I/O Banks	3 banks	3 banks
Backplane Current ⁽¹⁾	650 mA at 5V dc 40 mA at 24V dc	680 mA at 5V dc 40 mA at 24V dc
Power Dissipation	4.21W	4.36W
Power Supply Distance Rating	4 (The controller must be within four slot positions of the power supply.)	
Replacement Battery	1769-BA	
Weight	0.32 kg (0.70 lb.)	
Programming Cable	1747-CP3 or 1756-CP3	
Panel Mounting Screw Torque (using M4 or #8 screws)	10 - 16 in-lb (1.1 - 1.8 Nm)	
Wiring		
Connectors	1 BNC connector 1 NAP (1786-CP cable)	2 BNC connectors for redundant media operation 1 NAP (1786-CP cable)
Category	2 – On communication ports ⁽³⁾	2 – On communication ports ⁽³⁾
Isolation Voltage (continuous-voltage withstand rating)	30V dc Tested to withstand 710V dc for 60 seconds	
Environmental Conditions		
Operational Temperature	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): 0 to 60°C (32 to 140°F)	
Storage Temperature	IEC 60068-2-1 (Test Ab, Un-packaged Non-operating Cold), IEC 60068-2-2 (Test Bb, Un-packaged Non-operating Dry Heat), IEC 60068-2-14 (Test Na, Un-packaged Non-operating Thermal Shock): -40 to 85°C (-40 to 185°F)	
Relative Humidity	IEC 60068-2-30 (Test Db, Un-packaged Non-operating Damp Heat): 5 to 95% non-condensing	
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5g @ 10-500Hz	

Description	1769-L32C	1769-L35CR
Operating Shock	IEC 60068-2-27 (Test Ea, Unpackaged Shock): DIN mount - Operating: 20G Panel mount - Operating: 30G	
Non-Operating Shock	IEC 60068-2-27 (Test Ea, Unpackaged Shock): DIN mount - Non-operating: 30G Panel mount - Non-operating: 40G	
Emissions	CISPR 11: Group 1, Class A	
ESD Immunity	IEC 61000-4-2: 4kV contact discharges 8kV air discharges	
Radiated RF Immunity	IEC 61000-4-3: 10V/m with 1kHz sine-wave 80%AM from 80MHz to 2000MHz 10V/m with 200Hz 50% Pulse 100%AM at 900Mhz 10V/m with 200Hz 50% Pulse 100%AM at 1890Mhz	
EFT/B Immunity	IEC 61000-4-4: +/-2kV at 5kHz on communications ports	
Surge Transient Immunity	IEC 61000-4-5: +/-2kV line-earth(CM) on communications ports	
Conducted RF Immunity	IEC 61000-4-6: 10Vrms with 1kHz sine-wave 80%AM from 150kHz to 80MHz	
Enclosure Type Rating	None (open-style)	
Certifications: ⁽²⁾ (when product is marked)	c-UL-us UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada CE European Union 89/336/EEC EMC Directive, compliant with: EN 50082-2; Industrial Immunity EN 61326; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions C-Tick Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions CI ControlNet Int'l conformance tested to ControlNet specifications	

⁽¹⁾ This specification is also known as Power Consumption.

⁽²⁾ See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

⁽³⁾ Use this Conductor Category information for planning conductor routing. Refer to Publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines".

Obtain Related Documentation

This product also uses the following manuals:

- *CompactLogix System User Manual*, publication 1769-UM0011
- *ControlNet Modules in Logix5000 Control Systems User Manual*, publication CNET-UM001
- *Logix5000 Controllers Common Procedures*, publication 1756-PM001
- *Logix5000 Controllers General Instructions Reference Manual*, publication 1756-RM003
- *Logix5000 Controllers Process Control and Drives Instructions Reference Manual*, publication 1756-RM006

To view manuals, visit www.rockwellautomation.com/literature. To obtain a hard manual, contact your distributor or Rockwell Automation representative.

www.rockwellautomation.com

Corporate Headquarters

Rockwell Automation, 777 East Wisconsin Avenue, Suite 1400, Milwaukee, WI, 53202-5302 USA, Tel: (1) 414.212.5200, Fax: (1) 414.212.5201

Headquarters for Allen-Bradley Products, Rockwell Software Products and Global Manufacturing Solutions

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

Europe/Middle East/Africa: Rockwell Automation SA/NV, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Headquarters for Dodge and Reliance Electric Products

Americas: Rockwell Automation, 6040 Ponders Court, Greenville, SC 29615-4617 USA, Tel: (1) 864.297.4800, Fax: (1) 864.281.2433

Europe/Middle East/Africa: Rockwell Automation, Herman-Heinrich-Gossen-Strasse 3, 50858 Köln, Germany, Tel: 49 (0) 2234 379410, Fax: 49 (0) 2234 379416

Asia Pacific: Rockwell Automation, 55 Newton Road, #11-01/02 Revenue House, Singapore 307987, Tel: (65) 6356 9077, Fax: (65) 6356 9011

Publication 1769-IN070B-EN-P - December 2004

PN 957944-01

Supersedes Publication 1769-IN070A-EN-P - September 2004

Copyright © 2004 Rockwell Automation, Inc. All rights reserved. Printed in the U.S.A.